

ACLOUD Flight #15 – Polar 5 – 170609

Mission PI P5: Christof Lüpkes

Objectives:

Comparison flight with Polar 6

Crew:

Polar 5	
PI	Christof Lüpkes
Basis Data Acq.	Martin Gehrmann
SMART	Johannes Stapf
Eagle/Hawk	Elena Ruiz
MiRAC	Tobias Doktorowski
AMALi	Tobias Donth

Flight times:

Polar 5	
Take off	08:05 GMT
Touch down	09:25 GMT

Predicted Weather Situation:

Wind: Variable over Svalbard, and wind from south over Framstrait.

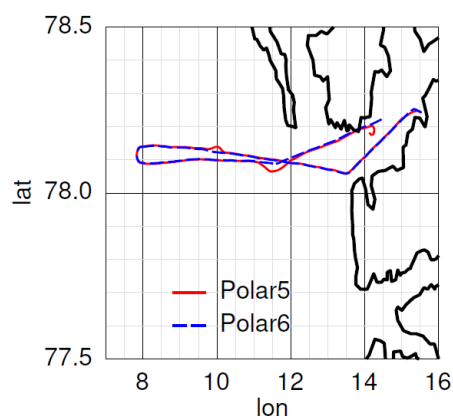
Clouds: only few Cirrus clouds observed over the airport, but increasing cloud cover towards west due to an approaching front.

During the flight, this prediction was confirmed, clouds were observed in different layers. A layer with thin low clouds was sometimes present over Framstrait. Another thin layer of mid-level clouds occurred at 10.000 ft over Fram Strait.

Overview:

The strategy was to fly with both aircraft closely collocated in a horizontal distance of 2000 ft to obtain a comparison especially of the noseboom measurements, Licor and INS. The strategy was to climb up to 10.000 ft, interrupted by horizontal flight sections at 5000 ft and 8000 ft of 3 minutes duration. After the westernmost position was reached, the track was flown in opposite direction with a higher speed.

Flight track:





This foto shows P6 between the two cloud layers over Fram Strait.

Instrument Status:

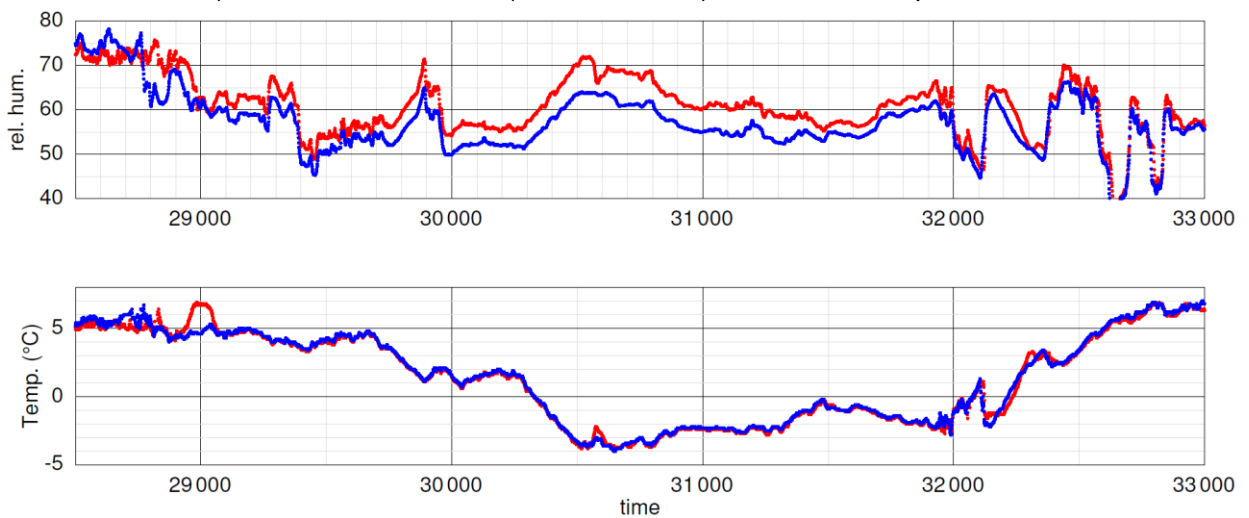
Polar 5	
Basis data acquisition	
Nose Boom	
MiRAC	
HATPRO	
AMALi	
SMART	
Eagle/Hawk	
Drop Sondes	

Instrumental problems

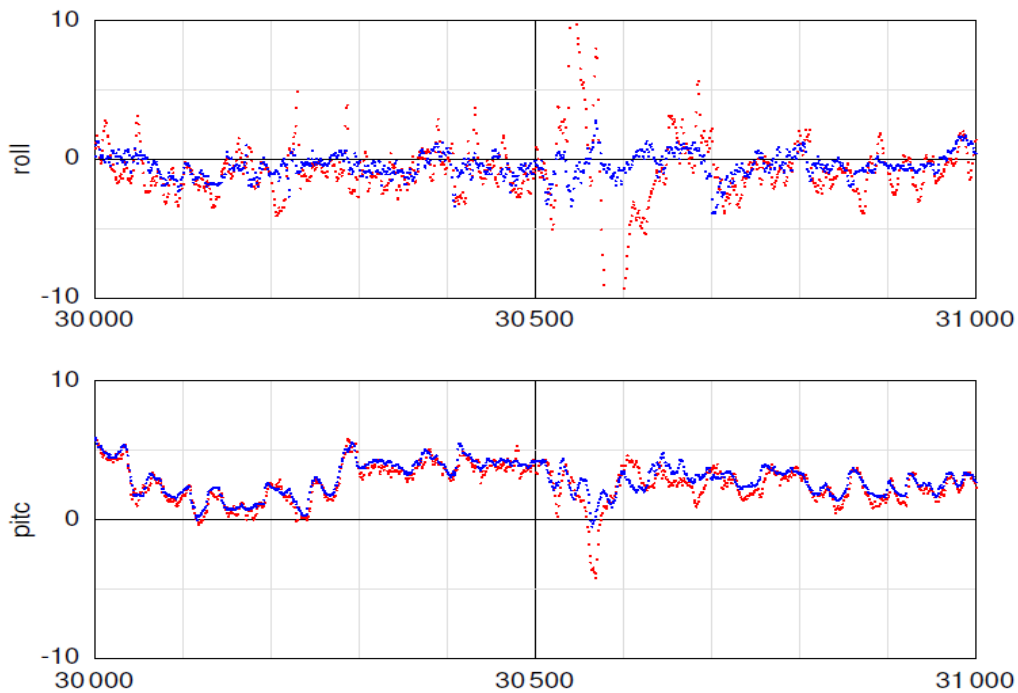
Quicklooks:

Noseboom data:

The Figure below shows relative humidity and air temperature of both aircraft (blue is Polar 6 and red is Polar 5) as a function of time (UTC, seconds). The curves represent raw data

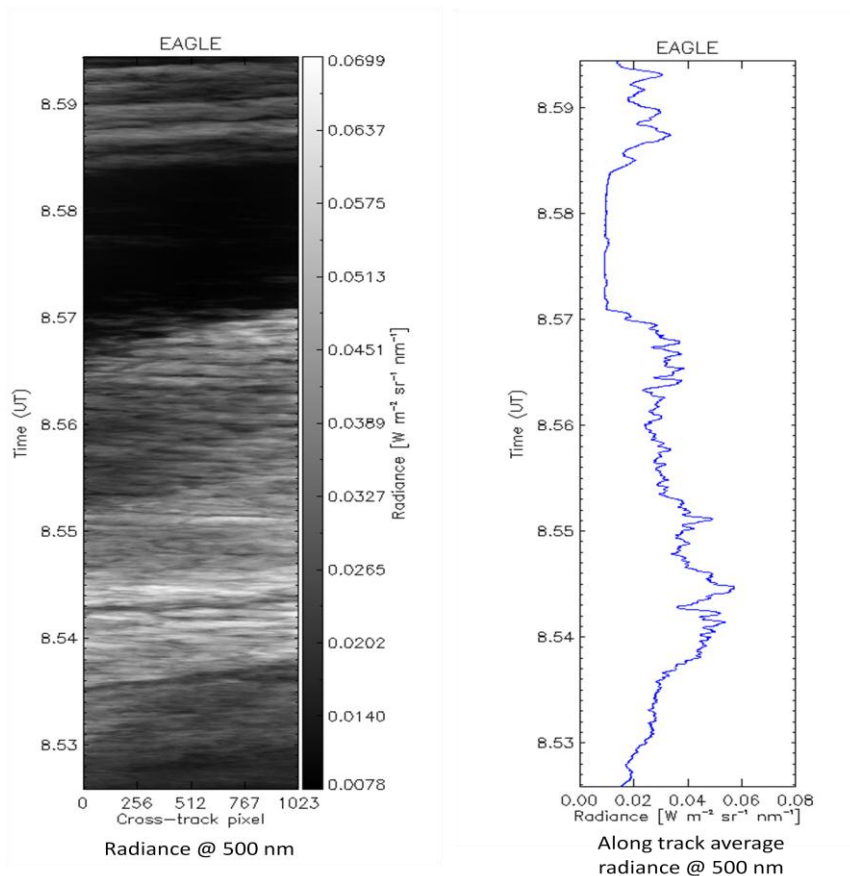


which have not yet been corrected e.g. for effects of dynamic pressure.

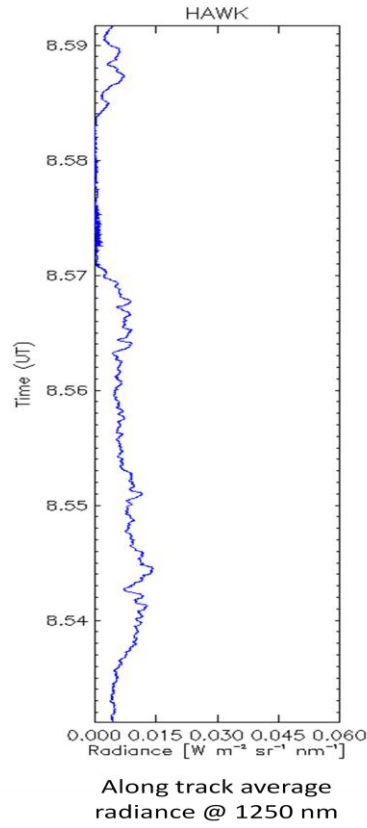
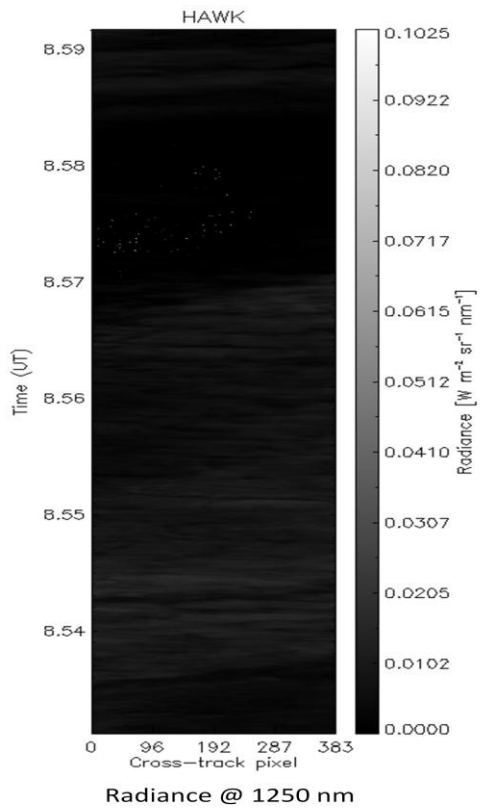


The above Figure shows pitch and roll angles as a function of time (UTC, seconds) during a selected period of the flight.

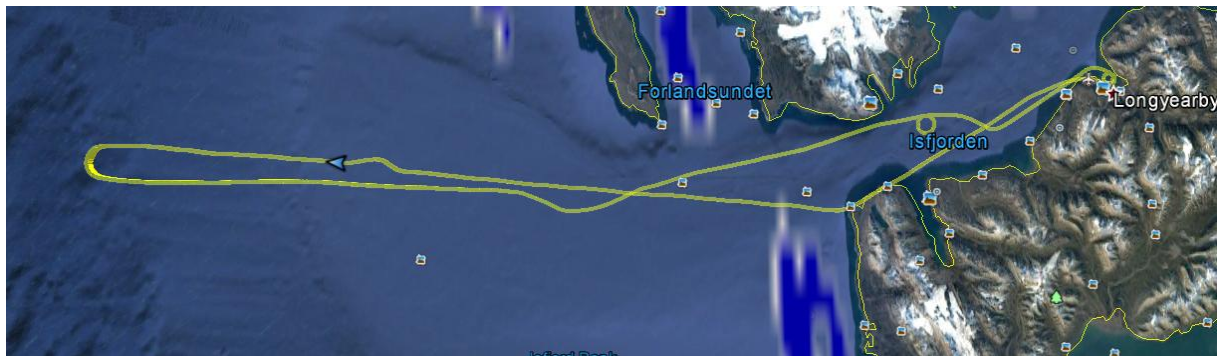
Eagle/Hawk (Elena Ruiz-Donoso)



The grey-scale images (left) correspond to the radiance measured at one certain wavelength (500 nm for Eagle and 1250 for Hawk). The right graph shows for both instruments the across-track averaged along-track radiance. Cloud free areas correspond to values close to 0.

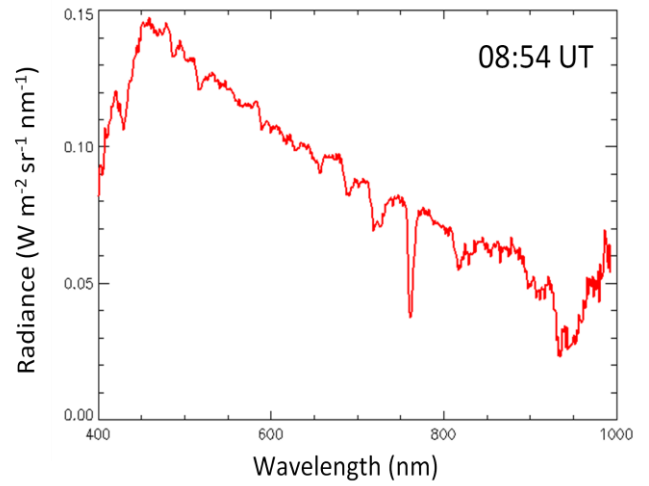
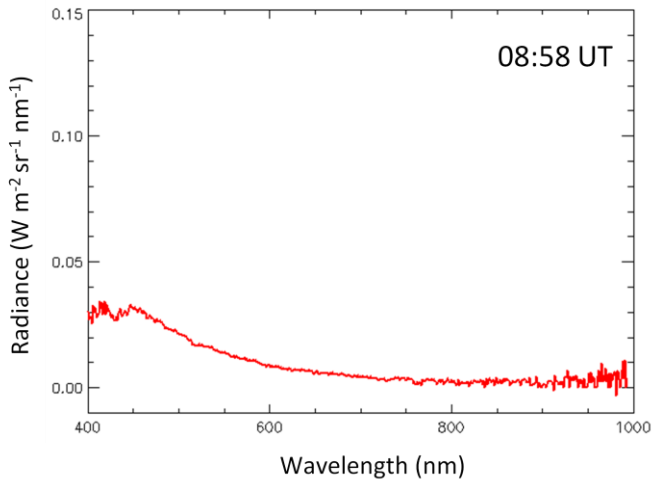


The measurements correspond to the moment indicated by an arrow in the plot of the flight track shown below.



The 4 plots below show the radiance spectra at nadir for a cloudy situation (8.54 UT) and a cloudfree one (8.58 UT). Again, the cloud free situation shows a much smaller radiance for both instruments.

EAGLE



HAWK

